AL.1.478

SEP 30 1987

SECOND CLASS MAIL REGISTRATION NUMBER 4405 EDMONTON VOLUME TEN NUMBER TWO 1987

# ENVIRONMENT VIEWS

## Environmental Health

# ENVIRONMENT VIEWS

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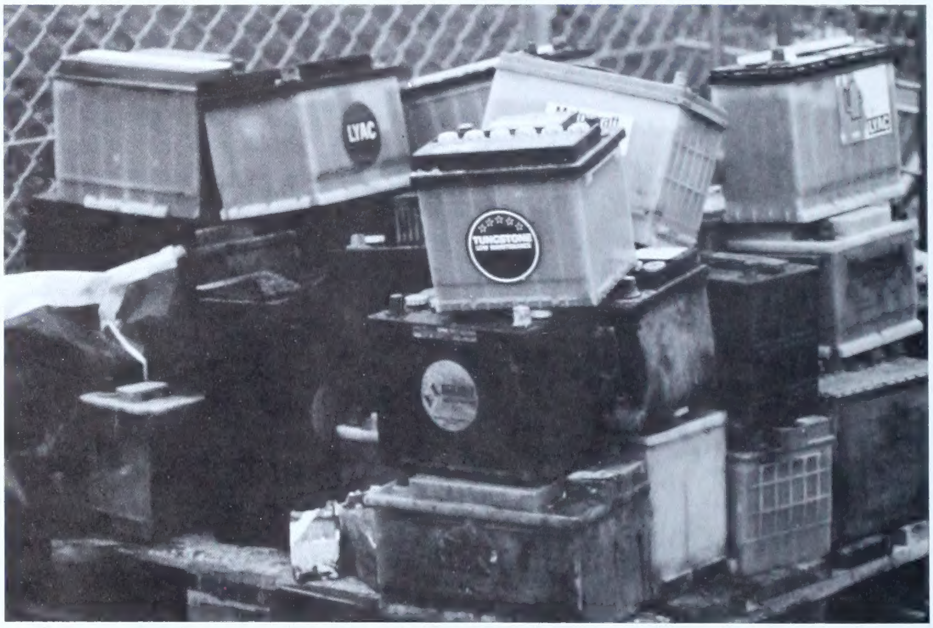

*Environment Views* is published quarterly by Alberta Environment. Each issue deals with a specific topic from various viewpoints with the aim of increasing awareness of environmental issues among Albertans. *Environment Views* is directed by an independent board with representation from environmental groups, government and industry. The views expressed by the publication are not necessarily those of Alberta Environment.

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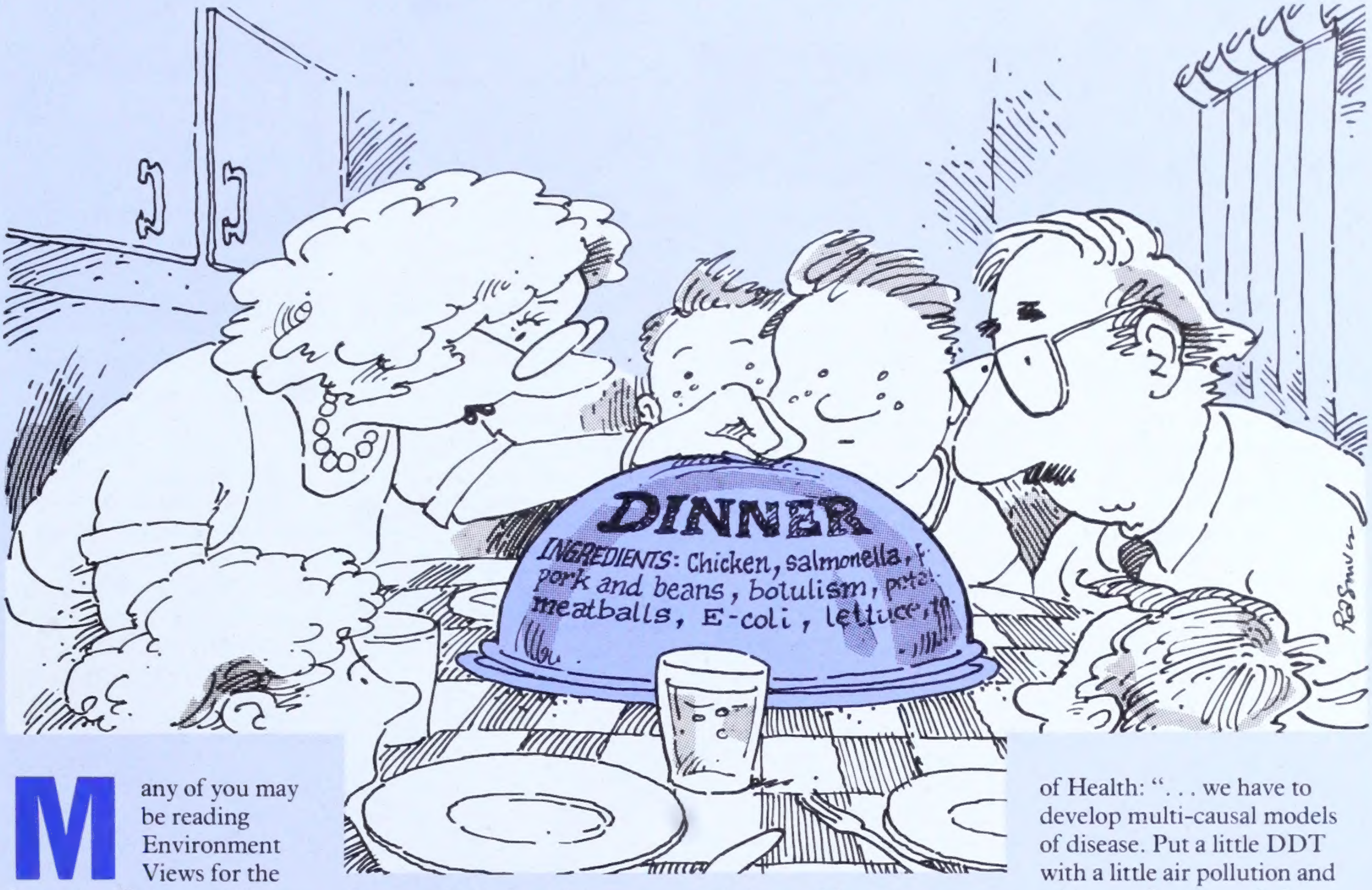
The editorial board was helped in planning this issue by John O'Laney of the Edmonton Board of Health; Ron Findlay of AMOCO and Dennis Stokes of Alberta Environment's Research Management Division.

Alberta
ENVIRONMENT

# EDITOR'S NOTEBOOK


DINNER
INGREDIENTS: Chicken, salmonella,
pork and beans, botulism, pota
meatballs, E-coli, lettuce,
RBSmuw

Many of you may be reading Environment Views for the first time. Welcome! We have added almost a thousand new subscribers to our mailing list in the past few weeks as we begin a small promotion of the magazine, the first promotion it has had since it was founded nine years ago. We hope to reach Albertans with an interest in the environment who for one reason or another, have never heard of Environment Views. We are attempting to convince them to give us a try by telling them, ever so modestly, about our balanced and interesting coverage of current environmental issues. We're pleased with the result of our first efforts, but we're sure we can do even better with your help. If you believe Environment Views is worthwhile, please pass this issue along to friends and colleagues that you think might be interested. Subscriptions are free. Send in the the enclosed card or Communications at the address opposite.

We will also send sample copies to meetings of organizations with an interest in the environment, and have a display that can be taken to conferences.

This month's topic, environmental health, is a fascinating one. I'm no paranoid, but I have never much liked the idea of carcinogens in the drinking water or deadly viruses in the air conditioning. The goal of the stories in this issue is to define and explain some of the key issues in environmental health and to perhaps temper some paranoia about the subject. At one time, environmental health was perceived as a sanitation concern, and guaranteeing a high standard of public health was largely a matter of protecting food and drinking water from contamination by bacteria and viruses. Now the concerns are much broader, partly because a technological society has created many new risks, and partly because our technology has made it possible for us to detect even very small hazards: minute amounts of trace metals in drinking water, for example.

Defining environmental health risks is therefore difficult. By the broadest definition, almost any health risk is included. We've chosen a narrower one for the purposes of these articles: that aspect of public health concerned with things we do to the environment that, in turn, affect our health.

Assessing risks is complicated by the fact that with physical and chemical hazards, cause and effects are not as clearcut as they are with bacteria-caused disease. Says John O'Laney, director of the environmental health division of Edmonton Board of Health: ". . . we have to develop multi-causal models of disease. Put a little DDT with a little air pollution and add some factory emissions and you start to have an effect on a person's health as the body burden increases." (see story p.7)

As always, we have tried to get an individual perspective on the issue. As you will read in our "What You Can Do" story, you aren't entirely helpless in the face of environmental hazards. By handling hazardous materials correctly (from raw poultry to paint solvents) you can protect yourselves and others. By becoming better informed about the hazards you encounter, you can decrease the risks you face.

If you have opinions about our coverage or about any other environmental issue, write to us. We will be glad to share your views with other readers.

*The editor of* Environment Views, *Maryhelen Vicars, is a freelance writer and editor based in Edmonton.*

# AROUND THE PROVINCE a review by Gail Helgason

## Green Light for Panther River Pipeline

Shell Canada Ltd. will begin work early in 1988 on a $20-million pipeline in the environmentally-sensitive Panther River wilderness area near Sundre, Alta.

The province's Energy Resources Conservation Board recently approved the company's application for a 35-kilometre pipeline in the Panther River area, on the northeast boundary of Banff National Park.

According to Shell spokesman Randy Richie, the pipeline will bring into production a set of five gas wells drilled between 1958 and 1980. The gas, which has an eight to 10-percent hydrogen sulphide content, will be linked to the Burnt Timber gas processing plant.

Environmentalist are concerned that the pipeline will bring more people into the wilderness area through clearings where the pipeline has been installed.

Bighorn sheep, which inhabit the area between the Panther and Red Deer rivers, are a particular concern. They tend to concentrate around well sites, making easy targets for hunters.

Shell, however, studied the habitat of bighorn sheep in the region for two years and concluded that the pipeline would not be harmful to it.

Moreover, the company says special techniques developed for pipeline construction in the Eastern Slopes will effectively guard against further intrusion into the area.

The pipeline route does not follow a direct line and will not be visible from wellhead clearings, says Ralph Gorby, head engineer of regulatory approvals for Shell Canada in Calgary. Rocks and trees will be used as barriers and camouflage.

"Other environmental protection measures include careful reclamation which involves salvaging and replacing the most fertile topsoil, and using a specially-prepared seed mixture to revegetate the area, one known to be successful in that area," he said.

He added that Shell is one of the most experienced companies in pipeline construction in the Eastern Slopes, having developed a wide range of environmentally-sound techniques from its experience in the Jumping Pound, Burnt Timber and Moose Mountain regions.

Gorby noted that Shell has worked closely with the Alberta Forest Service, which is responsible for access control into the area.

Despite Shell's precautions, some environmentalists remain fearful that the clearings will increase human penetration of the wilderness area.

Brian Horejsi, vice-president of the Alberta Wilderness Association (AWA), has said that he doubts that people can be kept from entering the area through the pipeline clearings.

The association is "not entirely satisfied" with the location or the way the application has been handled, according to Horejsi.

Dianne Pachal, executive-director of the AWA, says the impact on tourism is one aspect often neglected in public discussion of encroachment on the Eastern Slopes.

She noted that many wilderness adventure companies use the area, and stand to suffer if the wilderness qualities sought by their clientele are diminished.

She also questioned the reliability of statistics on bighorn sheep populations. She says only "general population counts" are available.

## Kananaskis Hunt Ends

Grizzly bear hunting in Kananaskis Country has been postponed indefinitely, according to Bill Hall, assistant director of wildlife with Alberta Fish and Wildlife.

One male grizzly was killed during the hunt, the first in the Kananaskis area since 1968. Twenty hunting permits were issued and 22 bears sighted during the season, which lasted from April 1 to May 15.

Hall says the harvest "is what we expected, and is well within our guidelines for managing that species."

Environmentalists had voiced concern that hunting could deplete the grizzly bear population in the area.

## Ecological Sites Program Launched

A long-delayed provincial plan to establish ecological reserves in Alberta has won guarded praise from conservationists.

"Certainly we're pleased that the project is finally off the ground," says Vivian Pharis of Cochrane, executive director of the Alberta Wilderness Association (AWA). "We've been waiting since 1972."

Forestry Minister Don Sparrow and Parks Minister Norm Weiss recently announced the creation of seven such reserves to protect ecologically-sensitive areas.

Public uses such as hiking and photography will be allowed in the areas, which are meant to preserve significant examples of Alberta's six natural environments for both scientific study and limited public use.

The reserves are the first to be established since Alberta passed enabling legislation six years ago. Up to eight more reserves may be named by the end of the year.

In making the announcement, Sparrow said he was acting on commitments made at a recent international conference on wildlife held in Regina. At that time, he promised to increase the province's emphasis on conservation.

The seven areas are:

- Whitemud Falls, on the Clearwater River near Fort McMurray. The area is typical of boreal forest and includes 25-metre bedrock stacks and 30-metre falls;

- Marshybank, on the Brazeau River northwest of Edmonton. A rolling uplands region covered by pine forest and uncommon plant life;
- Crow Lake, midway between Fort McMurray and Lac la Biche. A transition zone between boreal plains and uplands, and a nesting spot for bald eagles;
- Silver Valley, in the Peace River region. Represents Peace River parklands, with speargrass, saskatoon thickets and aspen forests;
- Kootenay Plains, southwest of Nordegg. Includes open grasslands and an unusually dry climate, with Douglas fir, limber pine and rare plants;
- Athabasca Dunes, just east of Wood Buffalo National Park. Includes an active sand dune area, as well as representing the Canadian Shield which occurs only in the extreme northeastern part of the province;
- Goose Mountain, a foothills area west of Swan Hills. Includes very old spruce forest and examples of 20 different kinds of muskeg.

The province has also announced its intention to create an eighth reserve this year at Kennedy Coulee, near Milk River in southern Alberta.

Larry Duchesne, secretary of the Advisory Committee on Wilderness Areas and Ecological Reserves with Alberta Recreation and Parks, says several other reserves are expected to be established in the next two years.

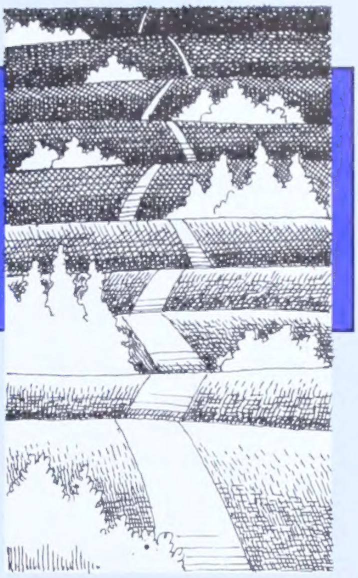
Pharis calls the moves a step in the right direction, but says the AWA is disappointed at the size of the ecological reserves. The area the AWA has proposed for Kennedy Coulee would be almost 200 square kilometres, about five times larger than the planned area.

"And we thought that would be minimal to preserve the ecosystem."

She also said the AWA fears that the parkland area near Rumsey in east-central Alberta will be "punched full of holes" from sour gas drilling before it receives protected status.

Duchesne, however, said the area is currently being managed as a restricted use region, receiving the same protection accorded to ecological reserves.

# Momentum Picks Up For National Hiking Trail



The dream of one Alberta man for a coast-to-coast hiking trail is several steps nearer to reality following formal inauguration on Parliament Hill.

World-reknowned environmentalist Maurice Strong and House of Commons Speaker John Fraser recently nailed a green and black marker on an Ottawa tree to officially kick off the development of the 10,000-kilometre trail. The tree is near the start of the Rideau Trail, which will be partly incorporated into the national trail.

Doug Campbell of Calgary, who initiated the idea for the trail, says existing trail systems will be used and connected where possible, and park authorities are expected to co-operate in the effort to co-ordinate the work of volunteer organizations.

Fitness Canada provides some funding for national meetings and promotional materials.

The trail will probably bisect southern Alberta, cutting across the southwest corner of Banff National Park, then winding through Kananaskis Country to Calgary and along the Bow River to Cypress Hills Provincial Park. It's estimated that it may take 15 to 20 years to develop.

Says Campbell: "This massive voluntary effort will call upon the co-operative spirit of all Canadians in adding a new dimension to our country — a corridor which will contribute significantly to environmental awareness, physical fitness, youth development and preservation of our natural landscapes."

As well as keeping the dream alive for many years, Campbell served as president of the National Trail Association, which was formed in 1977 to research the idea of a recreational trail from the Atlantic to the Pacific.

Vince DeJong of Edmonton, the association's historian, says the biggest challenge in Alberta will be to rally enough volunteers. Organized hiking is less developed in Alberta than in such provinces as Ontario, Quebec and British Columbia, he said.

"We have to set up a network of volunteers to maintain the trail and that can only be done in the urban areas."

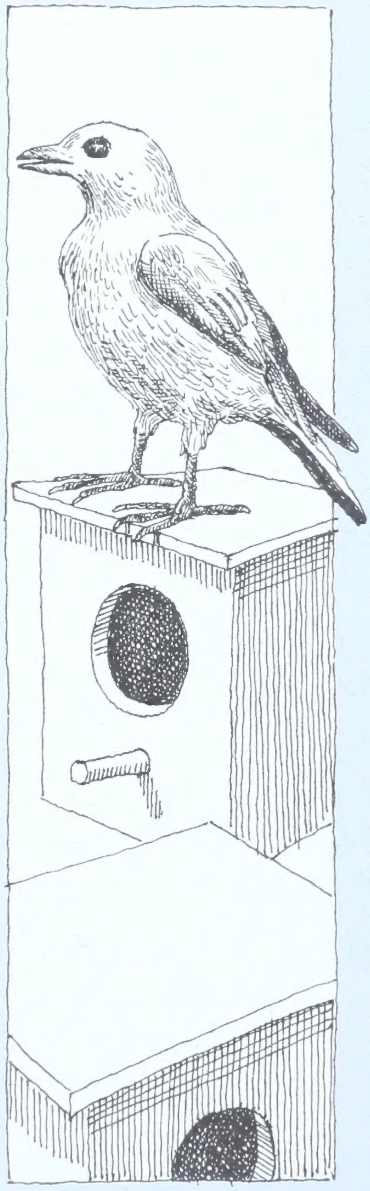
In inaugurating the footpath, Strong noted that hikers are conservationists by nature and a "powerful force" in the preservation of our world environment.

"Those who work to bring about the dream of a footpath from Newfoundland to Vancouver Island can be counted on to support measures to protect the lifeblood of spaceship earth."

## Bluebird Comeback At Provost

The brilliant flash of the bluebird is returning to a portion of east-central Alberta, thanks largely to one family's devotion.

During the last 18 years, Lois and Roger Johnson and their three children have built more than 270 bluebird houses along a 250-kilometre "bluebird trail" which winds by farm fence lines in the Provost area. They have also banded throusands of the colorful birds.



Bluebirds were once fairly common in the region, near the Saskatchewan border about 100 kilometres south of Lloydminster. But when land was cleared and old trees removed, a lot of their habitat disappeared.

"They do not build their own houses, but prefer instead to move into old woodpecker holes", explains Mrs. Johnson, a Grade Four teacher.

"When we first moved to Provost in 1969, we had seen bluebirds maybe once in western Alberta."

The family, however, realized that the natural grassland around Provost was well suited to attracting bluebirds.

"It's really the best habitat for the bluebird — it also has a lot of grasshoppers, and that's predominantly what they eat."

The Johnson family started by building 13 houses, and have added more each year. They began banding in 1973 and by this fall expect to have banded more than 3,000 bluebirds.

Johnson kept track of the family's travels last year along the bluebird trail and found they logged almost 3,000 kilometres and spent seven full days each.

Mrs. Johnson enjoys taking senior citizens on bluebird-watching outings: "They are thrilled because they remember when bluebirds were quite common on the prairies."

She praises local landowners for supporting the idea and allowing the houses to be built on their property.

"It's a plus for the environment too, in that the landowners are learning more about bluebirds."

## Minister calls for Wide-Ranging Review of Environment Department Practices

A sweeping review of the provincial Environment Department's practices and legislation has sparked renewed hope among environmentalists for better enforcement and improved licensing standards.

Environment Minister Ken Kowalski in June directed a major review of Alberta Environment's licensing, standard setting, monitoring and enforcement procedures, as well as an immediate review of environmental protection legislation.

"It's something the Environmental Law Centre has advocated for a long time," says lawyer Donna Tingley, executive director of the centre and a member of the review board.

"I sense that they are ready to make a change. I'm reasonably optimistic this will be a start."

Kowalski's move came after the provincial government found itself unable to prosecute a Calgary fertilizer company for releasing a noxious gas cloud over the city in late March.

Twelve people were sent to hospital following the incident. The Attorney General, however, said loopholes in Western Co-operative Fertilizers' emission-control licence made him unable to take legal action against the firm.

The clause in Western's operating licence exempted it from emission limits during start-up periods. Forty-five companies in the province have loophole clauses similar to Western's, Kowalski said.

In announcing the review, the minister said he felt "deeply disappointed" that prosecution would not proceed.

He said the new environmental enforcement division will involve technical and investigative experts with backgrounds in chemistry and law, rather than engineering.

"We would hope to have individuals who are specialized in gathering environmental evidence."

While stating that the department has previously employed competent engineers to write environmental licences, the minister said "a new situation" has arrived where the implicit meaning of nearly every word must be scrutinized.

The review committee, which will include people from both within and outside government, is expected to complete its work by fall.

Brad Wylynko, project director of Toxics Watch, called the review "timely". He hopes it will result in Alberta following the lead of Ontario, where government prosecution of polluters has led to a new level of pollution control.

But he noted that a wide-ranging study of all environmental legislation is essential if it is to be of real value.

*Gail Helgason, co-author of three outdoor guidebooks in Alberta, is an Edmonton freelance writer.*

Eric Bailey

# What is Environmental Health?

## *The effect of what we eat, drink and breathe.*

You rise early. Outside, a light rain falls, bathing the dying trees and your crumbling marble bird bath in mild sulphuric acid. You take a deep breath and wonder if this headache could be from acid rain or insulation. Your breakfast of burnt toast, strawberry jam, bacon and eggs contains at least three cancer-causing agents and may contribute to heart disease.

As you reach for the peanut butter, you remember reading that peanut products contain traces of a natural toxin highly carcinogenic in laboratory rats and linked by one study to liver cancer in humans. But you spread a good thick layer on anyway.

As one expert says, "We tolerate higher levels of such substances in things we have a taste for than we do in such things as drinking water."

Which, you think as you brush your teeth, doesn't taste as good as it once did. And you're worried about your sister on the farm down east, where well water is suspect because of contamination by pesticides and gasoline.

Spewing lead and oxides of nitrogen out your tailpipe on your way to work, you pass fire fighters spraying an overturned tanker with foam. You think this probably isn't as bad as that cloud of gas released from the fertilizer plant two weeks ago.

At work, you feel the fluorescent light, sealed windows and conditioned air might be making your headache worse. But maybe you drink too much coffee — you've heard caffeine contributes to heart disease but you've also heard decaf can lead to cancer. You wonder if something in the styrofoam of the cup might affect you.

Back home and out to the barbecue. Maybe that's a mistake — reminders about chronic low grade food poisoning

*Your breakfast may be fraught with unseen perils.*

GOVERNMENT OF ALBERTA

*Watch out for uncooked and undercooked meat and poultry.*

from underdone meats have been in the papers again. While you ponder the health risks of what's in the weiners you're about to drop on the grill, a city truck drones by spraying something to kill mosquitoes.

Welcome to the world of environmental health. Like millions of other North Americans, you're taking the first major step toward solving problems in public health caused by agents in the environment — you're learning to link the way you feel with the things you experience around you.

Environmental health may not be the best choice of words to describe the field. After all, nearly everything that makes us sick or hurts us comes to us from the environment.

For our purposes, environmental health could be described as that aspect of public health concerned with things we do to the environment that, in turn, affect our health. It covers three main types of hazard: microbial (germs), physical (radiation, vibration, noise) and chemical (toxins, carcinogens).

It's likely that carnivores and poisonous plants were high on early man's list of public health concerns. However, some of the first recorded observations of true environmental health problems come from such sources as Hippocrates and Pythagoras who saw a relationship between sewage and sickness.

Dr. Tee L. Guidotti, professor of occupational medicine at the University of Alberta, says there's evidence that some Romans knew they were getting lead poisoning from pewter goblets. But few advances were made in environmental health until the industrial revolution.

"The middle of the 19th century saw the beginning of the public health movement in England," says Guidotti. "Cleaning up the River Thames and reducing air pollution in London were major concerns."

Sanitation remained the central idea of environmental health until the middle of our century.

"One of the major factors that has put environmental health in high gear again has been the explosion in the number of chemicals developed since the Second World War," says Guidotti. One source estimates the number of chemical compounds manufactured in North America stands at 60,000 or 70,000 and that 700 to 1000 new ones are added to the list each year.

"Also, the effects of pollution and its impacts on environmental health have become more obvious, even outside major cities," Guidotti estimates.

Alberta's own experience with environmental health follows a similar pattern.

"Right up until the 1930s, environmental health issues predominated in the activities of the board," says Dr. James Howell, Medical Officer of Health for Edmonton, looking back at the history of the Edmonton Board of Health from its founding in 1892. "Water supply, sewage and garbage disposal were all issues that reached a crisis in Edmonton about 1923."

Patrick Bouthillier, professor emeritus of civil engineering at the University of Alberta, has an association with environmental health through pollution control and sanitary engineering in the province that goes back to 1947.

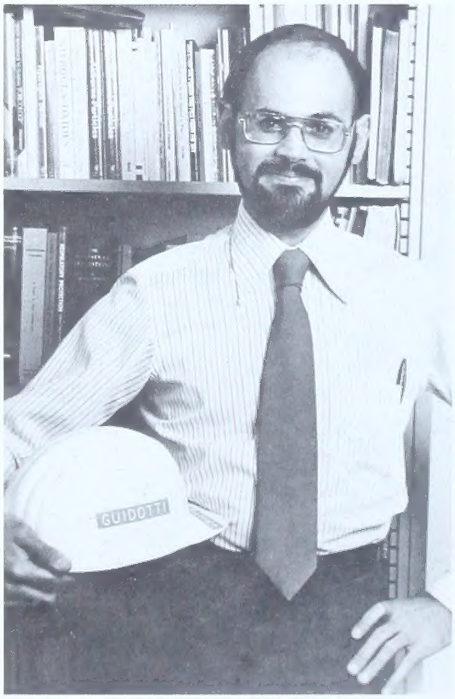
He keeps a copy of an old graph prepared by the medical officer of health for Edmonton in 1911, charting an outbreak of typhoid fever in the City of Strathcona which rose from zero to more than 80 cases between November 1 and December 9, 1910 — all attributable to poor sanitation.

"Chlorination of water was the biggest single factor in improving public health in the 1920s," says Bouthillier.

"There was a lot of resistance for a long time to chlorinating drinking water in Canadian cities. Vancouver only installed chlorination equipment during the Second World War because they were told the whole city would be off limits to armed services personnel if they didn't."

Attention turned next to cleaning up municipal wastes before they were discharged into the environment, a slow pro-

> *"We're learning to link the way we feel with the things we experience around us."*



*Dr. Tee L. Guidotti*

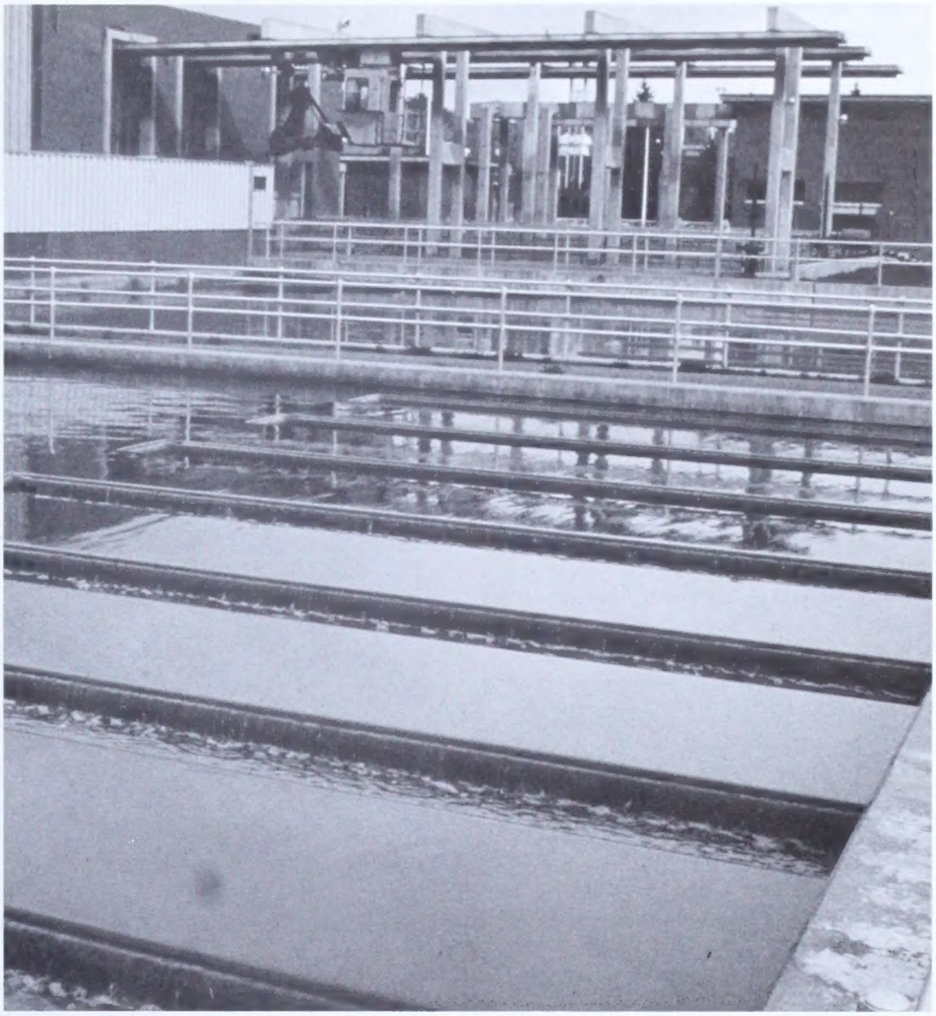
cess that continues to this day as engineers develop technologies to remove such toxic heavy metals as lead, cadmium, nickel and copper from sewage treatment sludge so that it can be used safely as landfill and fertilizer.

Bouthillier also remembers that “in the ’50s and ’60s, the air pollution problem started to hit big because we were getting sour gas wells. Down wind there were odor problems, and corrosion of fences, silverware, and electrical equipment.”

The list of concerns continued to grow. Effluent from pulp mills, fertilizer plants, gas plants, meat packers and dozens of other industries put stress on treatment facilities and challenged public health officials to try to develop standards for safe levels of emissions as quickly as new substances entered the system.

“We’ve come a long way since I started measuring river and stream pollution in Alberta. The general public these days is made aware very quickly of these problems — back when I started, people didn’t know what water pollution was — now a few people die from toxic waste and it’s in the news around the world.”

> *“Put a little DDT with a little air pollution and add some factory emissions and you start to have an effect.”*


CITY OF EDMONTON

*Edmonton’s Gold Bar wastewater treatment plant*

GOVERNMENT OF ALBERTA

*Dr. Patrick Bouthillier*

Awareness of an environmental health problem has always been the first step toward developing approaches to its solution — the observation of the link between cause and effect. However, causes and effects have become less clear in the study of physical and chemical hazards to health.

“The microscope revealed the presence of microbes in the environment and that led to the germ theory of disease — one microbe causes one illness,” says John O’Laney, director of the environmental health division of the Edmonton Board of Health. “Now, we have to develop multicausal models of disease. Put a little DDT with a little air pollution and add some factory emissions and you start to have an effect on a person’s health as the body burden increases.

“We don’t know what these things do over a long period of time by themselves, let alone in combination with each other.”

Dr. Howell emphasizes the contributing effects of other environmental factors.

"For almost all chronic diseases, there is a differential between the poor and the rich. It's hard to pin down the exact reason but such things as nutrition, where we live, what we do and our access to such things as therapy may all have an effect," says Howell.

Social values and fashion affect environmental health. Because we admire a good tan, skin cancer rates rise but the trend to smoking less and eating less fat has led to a marked decline in rates of heart disease, according to Dr. Howell.

Yet, although accidents are the leading cause of death among young people and heart disease remains the leader for all others, Albertans have been shaken to learn what effects such substances as exotic chemicals, pesticides, sour gas, toxic wastes and radioactive wastes may have.

However, according to Dr. Guidotti, "It's not at all clear we live in a more polluted environment today than we did in the past."

> *"Smoking less and eating less fat has led to a marked decline in rates of heart desease."*

He says we have become acutely aware of toxic substances in our environment at least partly because of our new-found ability to measure their presence. "We are now able to measure residues of chemicals in our environment down to parts per trillion. We have found things in the chemical soup we live in we never expected to find."

The science required to determine what possible effects these agents may have on human health is in its infancy.

Says O'Laney: "We need to be able to say, 'This causes that,' but we can't yet because we're not sure what to measure — especially long-term, low-level, multicausal chronic exposure."

The struggle to find out has been hampered by a lack of funding and a lack of research capability here.

Dr. Guidotti feels there's less expertise in the field of environmental health in Alberta now than there was three years ago. He blames the downturn in the provincial economy.

ENERGY RESOURCES CONSERVATION BOARD

*The Lodgepole sour gas well blowout focused the public's attention on the hazards of air pollution*

O'Laney speaks more bluntly: "Preventive medicine is not a very salable commodity, so it takes a Love Canal or a Lodgepole to get people to take an interest.

"Lodgepole did more for environmental health in this province than 20 years of writing reports and making submissions. We spend millions and millions after the fact — cleaning up Love Canal, doing diagnostic studies in Pincher Creek, when if (that money were) spent in prevention it would have a far greater impact on public health."

There's a larger picture. Acid breezes blow across international boundaries with little regard for pollution control legislation. Industrial waste, despite a few regulations on the handling of toxic wastes, drains across continents into the ocean. A garbage barge wanders the seas looking for a society prepared to accept the refuse of another.

Or worse, the industries that once impaired the environments of developed nations now seek less well-regulated environments to impair.

Some scientists call for a global approach to issues in environmental health. Shared oceans, watersheds, groundwater, air and ecosystems demand international co-operation in monitoring the source of hazards, tracking their spread, measuring their impact and devising international standards for safe levels of emission of substances in the environment.

The good news is that the process has begun. Issues in environmental health have always been resolved by observing a link between a cause in the environment and an effect on health, then bringing our ingenuity and understanding to bear on the problem.

Pat Bouthillier can rhyme off a list of diseases, toxins and wastes we've beaten in the last 50 years. "It's a recognition of these things that brings about desire to solve the problems. If we made them, we can destroy them.

"You can just stop the process that creates exotic wastes — we stopped DDT and we can stop any other if we have the will."

*Eric Bailey is a freelance writer specializing in outdoor and interpretive writing, working from Alder Flats.*

GOVERNMENT OF ALBERTA

Sharon Adams

# Managing the Risk

## *Setting standards for environmental health risks.*

There is a certain irony in setting standards to reduce environmental health risks. Man creates most of these risks to improve lifestyle, then tries to minimize them to increase span and quality of life.

In the trip through life, humans face natural risks, like the toxins produced by grains to temporarily protect seeds from fungus; lifestyle risks, such as smoking, drinking alcohol, eating fatty foods, driving fast; and man-produced risks, like air and water pollution.

Yet society seems to find environmental health risks more difficult to accept than natural hazards or pleasurable, yet detrimental, activities. Why should the one risk be so much harder to swallow? Dr. Sub Ramamoorthy, standards development officer, Standards and Approvals, Alberta Environment, believes delegation of risk assessment and risk management is part of the problem.

"It's like slicing bread," he says. "If you control both the knife and the bread, you can put the hand holding the bread close to the knife to get the thinnest slice possible. If you give the knife to someone else, you move the hand holding the bread farther away. The public's acceptance of standards is much the same. When somebody else decides how much risk you should take, the margin changes."

The first step in setting that margin is proving that a substance causes a health problem. Then the risk is assessed to determine how serious that effect is. Finally, society determines how much risk the population can and will accept.

This isn't as easy as it sounds, and can take a long time. The process is long, complicated, changeable — and once risks have been assessed and exposure standards set, difficult for the layman to comprehend.

*Workers in hazardous situations are required to wear protective gear.*

### *Association versus Causality*

To begin with, a substance has to be proven to affect human health, but just because an environmental factor is associated with a health problem does not mean the factor causes the problem.

For instance, says Dr. Graham Gibbs, executive director of Alberta's Occupational Health Services, it took decades to prove smoking tobacco causes lung cancer. "Even into the 1970s some argued that although the association was strong, smoking didn't cause cancer."

In addition, science continually builds up its knowledge base. A substance that appears one day to affect only a limited number of people can the next be found to have a general adverse effect.

An example, says Gibbs, is asbestos. Prior to 1959, it was linked to two health effects in workers: asbestosis (scarring of the lungs) and lung cancer. Standards were set to protect workers. Then rare tumors were discovered in people with infrequent or low exposure to asbestos, and the standard had to be changed.

### *Risk Assessment*

Once a cause and effect has been proven, then the risk is measured. In Alberta, Alberta Environment's Standards and Approvals Division determines general public risk and Alberta Community and Occupational Health's, Occupational Health and Safety Division, sets occupational exposure standards.

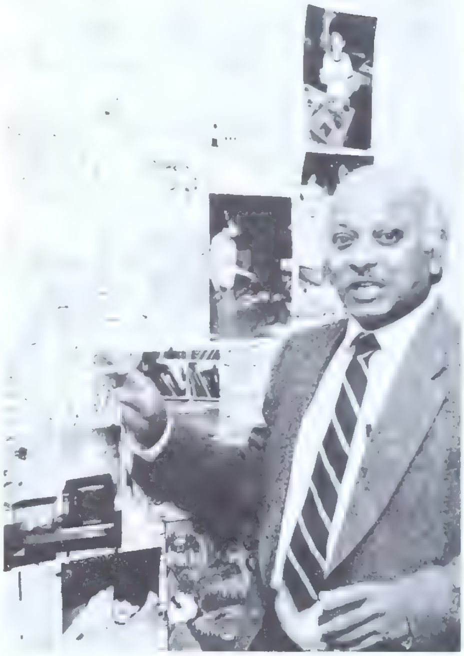
The process of assessing risks is the same in both cases.

Risk is defined as the expected frequency of adverse effects from exposure to a pollutant, says Ramamoorthy. Expected frequency is determined through clinical observation of sufferers or epidemiological studies (post-event or retrospective analysis) examinations and studies of exposed animals.

Both present problems. In human observation, it's difficult to separate out the large number of variables which may contribute to the health effect.

"We have to look at exposure patterns," says Ramamoorthy. "What population is exposed to it; how long were they exposed and at what concentration; composition of the population; bias from unidentified confounding factors such as illness, use of drugs, etc; and comparison to effects on different populations.

"Epidemiological studies can be expensive and time consuming."



*Dr. Sub Ramamoorthy*

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He cites one U.S. study which examined an environmental health risk in a New England community, using a similar-sized Texas community as a control group. The results were unusable because of a change in composition of the population. Although the two centres' populations remained equal over time, the composition of the New England community changed radically. Caucasians left and were replaced by other races prone to different health effects, skewing the comparison.

"Confounding factors are also a problem," says Gibbs. For example, it's difficult to measure respiratory effects of a substance in the workplace in a worker who is already suffering respiratory effects from smoking.

> *"What society will accept changes continuously."*

But relying on data extrapolated from animal experiments also poses problems. Animals are often given large doses to identify the substance's target organ better, or reduce the number of animals needed. But the data then has to be extrapolated to the effect of a much smaller dose over a much longer period, on a different species altogether.

Increasingly, the number of sources of exposure are taken into account.

Dr. Peter Toft, chief of Health and Welfare Canada's Monitoring and Criteria Division, is a member of a federal-provincial committee establishing guidelines for substances in drinking water. Their responsibilities are complicated by the fact that a waterborne substance may be encountered in drinking water, by inhaling water vapor in a shower or absorption through the skin while bathing.

Gibbs says eventually standards may reflect total exposures, such as is now done with radiation. "In some instances we have clear evidence of long-term risks associated with cumulative doses of substances." But such standards will be expensive to develop.

Ramamoorthy says the U.S. Environmental Protection Agency is looking into multi-media exposure now, and Canadian standard setters are beginning to appreciate its importance.

But currently, scientists first determine if a substance is toxic or carcinogenic. If toxic, data is extrapolated to determine the 'no observable effect level' (NOEL), expressed as a maximum dose level — exposure to so many parts per million of a substance over a certain time period produces no observable effect.

Carcinogens' effects are expressed as the extra cancer deaths per million, or 10 million, produced by exposure to the substance. This, too, can be expressed as a relative risk.

Finally, scientists apply a safety factor to these numbers which takes into account inter-species variations, the nature and severity of effect, the adequacy of the study and state of knowledge about the substance. These can reduce the original number by a factor of up to 5000.

### *Risk Management*

Once the number is set, says Ramamoorthy, the scientific process ends and the value judgment begins.

"A zero risk is ideal, but impossible to achieve," says Ramamoorthy.

So begins the debate about how much risk is acceptable, and under what conditions. Participants can include scientists, politicians, environmental groups, the general public, industry and the media.

This can be a complicated political process. Risk changes according to frequency of exposure, dosage, ameliorating behaviors, like wearing proper safety gear in the workplace, and technological changes in restricting spread of pollutants or in more thorough eradication from the environment. But health risks don't solely determine acceptable risks; other value judgments, like effect on lifestyle and economic losses, are superimposed.

These questions are also overlaid by philosophical differences in the community. "An environmental group may be biased one way, favoring an extremely restrictive standard," says Ramamoorthy, while industry favors a more liberal standard.

In addition, numbers generated by scientists are seductive.

Few materials are "all or nothing", says Gibbs, ones which have to be totally eliminated or we'd all get diseases. "Because it's not all or nothing, we can put in controls to reduce the risk, we can reduce exposure and we can determine what risk is acceptable."

But control options have to be explored. Should a very low emission standard be set when it is not technologically feasible or is so costly business would shut down, throwing members of the community out of work? If such preventive measures are unfeasible, is clean-up a better alternative, or does it carry an adverse effect with greater impact than the impractical and expensive preventive measure?

What is acceptable can change dramatically from one interest group to another, from scientist to layman, even from moment to moment as technology develops.

"What society will accept changes continuously," says Gibbs. "Our knowledge base changes continuously. Better preventive techniques, better monitoring techniques and better diagnostic techniques come along. At the same time, society has become less tolerant of risks.

Lead exposure is an example. Thirty years ago, he says, lead workers sometimes showed a blue line above the teeth. "With time, we've moved to the point where we can say people should not get more than a certain amount in the bloodstream. You rarely see the blue line on the gum anymore — people wouldn't tolerate it today."

"In risk assessment, there are no magic numbers."

Gibbs also cautions that a standard is not the same as a "safe" exposure level. "Ideally, standards should be guidelines, and should be expressed as a range of values. There's a perception of a magic number below which you're safe and above which you're not. But it's not that clear-cut."

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*Susan Ruffo of the Alberta Federation of Labour Occupational Health Centre, counselling a worker.*

He likens levels of risk management to someone drinking alcohol and subsequently driving a car. There is nothing magic about the legal definition of impairment: when the blood alcohol level is at .08. Someone whose blood alcohol level is much lower may face more risk from other factors: driving at excessive speed for road conditions, driving at night, poor vehicle condition, or not fastening seatbelts.

And the familiar drunk driving limit serves as a good example of standards expressed as regulations, rather than guidelines. The driver testing at .08 blood alcohol content is liable to criminal prosecution and suspension of his driver's license, but goes free at .079.

"When we get into the regulatory field, we're forced into numerical control. If a risk is assessed at 1.9 parts per million, and someone is exposed to 2.1 parts per million, they're not going to drop over dead. It's better if people looked at the number as a guideline; the further below it, the better off they're going to be."

One problem with the false sense of security promoted by hard-number standards is the increasing number of people with sensitivities to certain substances. "People have to understand what a standard is, that certain people can react at exposures even below the standard and should take steps to protect themselves," Gibbs says.

Occupational health standards take into account many of these factors, he says. The Occupational Health and Safety Act and the Chemical Hazards Regulations list exposure limits based on time and concentration as well as giving ceiling, or maximum exposure, values. But they also include codes of practice for particular work sites specifying a proper work procedure, safety equipment or maintenance standards.

But drinking water guidelines must be conservative. Toft says the exposure levels "have to be safe for life-long consumption" but they do reflect multi-media exposure.

"When we do calculations," says Toft, "we try to take into account food and air exposures, too. We've always looked at an exposure to make sure the total risk won't exceed levels of concern. If it does, we lower the drinking water standard. But I'd like to see a roughly equal measure of risk from all media, rather than compensatory adjustment of just one."

Still, he says that "the numbers should be met on the average over the long term. If the number is exceeded suddenly, someone might believe the water is suddenly unsafe to drink. But that's not true."

*Sharon Adams, a Calgary freelance writer, is a journalism instructor at SAIT.*

Norma Ramage

# The Big Issues Today

*Five current and emerging issues in environmental health.*

Thanks to advances in technology, medicine and hygiene, Albertans today lead healthier and longer lives than their grandparents. We do not fear many of the problems and diseases common only 50 years ago.

But our technological age has a price, and the extent of that price is not yet known. Today we face new environmental health problems such as air pollution, pesticides, carcinogens, polluted water, sour gas emissions, noise and even fundamental changes to the very substance of the planet and its atmosphere.

And while the old diseases that afflicted our grandparents did their work quickly and openly, the problems we face today are often subtle, slow-moving and insidious.

It is, therefore, increasingly important that we recognize and understand these threats if we hope to minimize their final impact.

What follows is a brief look at five major environmental health problems in Alberta today.

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*Sunbathing gets more hazardous every year as the protective ozone layer is depleted*

## The Endangered Ozone

Thirteen years ago, U.S. scientist F. Sherwood Rowland warned the world that chemicals called Chlorofluorocarbons (CFCs) were gradually destroying the ozone layer which protects the earth from the more destructive effects of the sun's ultra-violet rays.

Rowland pinpointed the gas used in aerosol sprays as one source of CFCs and North Americans raced to dump their deodorants, hair sprays and laundry starches into the garbage can.

In August this year McDonald's restaurants announced they would be phasing out form containers which contibute CFCs during the manufacturing process.

Eleven years later in 1985, the British Antarctic Survey detected a mysterious "hole" in the ozone layer over the Antarctic. Then, earlier this year, a similar but smaller hole was found over the Arctic and, once again, the endangered ozone layer was in the headlines.

What is this ozone layer? And why is the possibility of its destruction so important? How can holes in the atmosphere in the Arctic and Antarctic affect life here in Alberta?

Simply put, ozone is a molecule consisting of three oxygen atoms rather than the normal two in oxygen gas. Although ozone is found on the earth's surface, it is most prevalent in the ozonosphere, a layer of atmosphere which stretches from 15 to 45 kilometres above the earth.

What ozone does is filter out 90 per cent of the sun's potentially-harmful ultraviolet radiation before it reaches us. Without this filtering effect, there would be a dramatic increase in skin cancers, crop yields could be endangered and certain kinds of animals and plants could be destroyed or deformed in the larval or fetal stages. If the ozone layer ever completely disappeared, life on earth would end.

Statistics from the U.S. Environmental Protection Agency (EPA) indicate that over the next 100 years, the ozone will be depleted at about 2.5 per cent a year unless something is done to reverse the trend. Unfortunately, there are several problems inherent in that reversal.

First, scientists do not agree on *why* ozone is disappearing. Some believe it is a natural, cyclical phenomenon that has happened in the past and will continue to happen in the future, while others link it to action of the sun. But, says Dr. Jim Kerr, a research scientist with Environment Canada's Experimental Studies Division, "the majority" of scientists agree with Rowland that CFCs are the culprits.

About 590,000 tonnes of these CFCs are produced by industry every year and they release chlorine atoms that strip away one of ozone's three oxygen atoms. Although Canada joined with the United States in banning CFC 11 and 12 (fluor gas) in household aerosols in the 1970s, forms of the chemical are still used in industry. It is used in air conditioning and refrigeration, in manufacturing rubber and plastics and in blowing insulation. As a result, says Kerr, CFC production in Canada is increasing between four and six per cent a year, and is now at the same level as it was when production was at its peak in the early 1970s before Rowland's initial warning.

In the United States, the Environmental Protection Agency (EPA) has warned of horrific consequences if the trend isn't reversed. An EPA study estimates that if the ozone layer is destroyed at an average increase of 2.5 per cent a year, people born between 1985 and 2029 could suffer an additional 8.3 million cases of skin cancer resulting in an additional 167,000 deaths. For people born between 2030 and 2074, the EPA statistics are even more horrifying: an extra 30 million cases of skin cancer including lethal melanomas, resulting in 620,000 additional deaths.

In 1985, 28 nations, including Canada, signed the Vienna Convention for Protection of the Ozone Layer, an agreement which committed them to framing an international strategy for dealing with ozone depletion. Look for more news about this agreement this fall when the strategy is expected to be finalized and ratified at a conference in Montreal.

### *Antibiotics in Animals*

In a gourmet meat market in New York, a sign over the juicy steaks and plump roasting chickens promises that the pricey products are guaranteed drug-free, raised without use of antibiotics.

The sign is the latest manifestation of a growing public concern over the use of antibiotics such as penicillin and tetracycline in animal feeds to increase weight gain. Studies have shown that such use creates antibiotic-resistant strains of salmonella, one of the bacteria that causes food poisoning in humans.

This could mean that when a patient contracts salmonella, treatment of the bacteria with antibiotics will be ineffective in controlling it. As well, the antibiotic may wipe out beneficial bacteria in the body, allowing the resistant salmonella free rein and increasing the severity of the attack.

Dr. John Waters, director of communicable disease control with Alberta Occupational and Community Health, says although there is no hard data in Canada showing a direct connection between antibiotics in feed and resistant salmonella strains, "I think there is no question that the hard data in the United States proves it (antibiotics in animal feed) contributes."

He points out that in Canada, "roughly 60 per cent of antibiotics for animal use go into feed. A huge amount is used."

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*Dr. John Waters*

However, Dr. Neil McKie of Agriculture Canada points out that all antibiotics used are licensed and controlled by the federal department of Health and Welfare. Farmers use the antibiotics because they keep the animals healthy and free of the minor ailments which could slow their growth. As a result, the antibiotics promote growth and weight gain, a vital factor in today's low-margin, hard-pressed livestock industry.

Dr. Margaret Finlayson, formerly a research bacteriologist with the provincial laboratory at the University of Alberta says the use of antibiotics in animal feed *is* an important issue but that the public may be ignoring a more important problem.

"We should be worrying about the overuse of antibiotics by humans which creates resistance and allergic reactions," she points out.

Waters agrees, saying, "My belief is that the widespread use of antibiotics in animal feeds contributes to developing resistant bacteria strains, but I also believe that eliminating their use in feed will not eliminate the problem of resistant organisms."

It is hard to pin down the exact number of food poisoning cases in any year since many symptoms are dismissed as flu, but a rough estimate quoted in a recent issue of Discover magazine indicated there may have been as many as 81 million cases of salmonella in the United States last year, and statistics show that 9,000 Americans died of bacterial food poisoning in 1986.

Waters also points to some other culprits for food poisoning, however, including problems in slaughtering, processing and food handling techniques. There is also the question of lifestyle and the trend toward rare roast beef instead of pot roast. Like most other bacteria, salmonella bacteria are killed if food is well-cooked.

The problem has become sufficiently important that a strong anti-antibiotics lobby has grown up in the United States. So far, says Waters, there has been no "organized" opposition in Canada.

In the meantime, watch for signs like that in the New York market to begin appearing in Canadian meat markets as public concern increases.

### *Pesticides and Health Risks*

It is a fact that every year in Alberta, hundreds of thousands of litres of toxic pesticides such as 2, 4-D, malathion, and carbofuran are used by farmers, governments and individual householders.

What has yet to be established as fact, however, is how much harm these chemicals can do in both the long and short term to the environment and to the plants, animals and people that live in it.

Some pesticides, such as Mirex and Kepone, have been linked to cancer in laboratory animals. Other pesticides, including several used in Alberta, are known to cause minor reactions such as skin rashes, nausea and headaches.

Many of the pesticides used throughout North America are bio-accumulable, which means they do not break down and can accumulate in the soil, in water and in foods. To date, there is no reliable scientific data on the results of long-term exposure to pesticides.

But in the meantime, argues Brad Wylynko, program director of Edmonton's

Toxic Watch, something should be done to limit and control increasing use of pesticides, not only in agriculture but by people in their own homes and gardens. "Instead of using these pesticides until they are proven unsafe like DDT, we should test them *first* and not use them until we know they are safe."

One eminent Canadian scientist who shares Wylynko's view is Dr. Ross Hume Hall, who in a 1981 report for the Canadian Environmental Advisory Council postulated that if all registered pesticides were subjected to rigorous environmental testing, "very few would be approved for use."

On the other side, the chemical industry and many farmers and agrologists believe pesticides are so beneficial that they should only be banned if there is concrete, irrefutable evidence of harm.

But evidence is hard to come by. A recent study of Kansas farm workers linked the herbicide 2,4-D (used throughout Alberta) to lymphatic cancer. As a result, Ontario, the largest user of the herbicide in Canada, banned its use. Less than a year later, however, a special five-member Ontario committee concluded the Kansas study did not have enough conclusive data linking the pesticide to cancer and the Ontario government rescinded its ban in late 1986.

Wylynko, however, is highly critical of the testing procedures used before Agriculture Canada "registers" or approves a pesticide for use. He points out that the federal government does not conduct the tests itself but only evaluates tests carried out by the chemical companies or laboratories hired by them.

"Government doesn't have enough money to do its own research so all the regulatory bodies are doing is evaluating the methodology of the tests."

To support his point, he cites the Industrial Bio-Test Laboratories (IBT) scandal in the United States in the 1970s when audits found deliberate falsification of tests performed by the lab for major chemical companies.

However, Hugh Philip, an epidemiologist with Alberta Environment's Vegreville Research Centre, says the IBT scandal is a guarantee that this kind of falsification won't ever happen again. "Companies are very sensitive to public perception of a conflict of interest existing in testing," he says, adding that reputable, independent labs such as Vegreville are now used extensively for tests.

But in the end, says Philip, no lab can test absolutely every scenario. "It's simply too expensive and if the companies had to do it, they'd simply stop production. That's particularly true in Canada where we're such a small market for these huge companies."

Instead, says Philip, companies, governments and individuals must look at the use of pesticides from a risk/benefit perspective.

And the benefits of using pesticides can be considerable, especially for farmers. Agriculture Canada studies show crop reductions of up to 40 per cent when pesticides are not used. And, says Philip, "Initially, not using insecticides, for example, would be devastating and there would be dramatic losses. Grasshoppers and cutworms could just munch through crops without fear of reprisals."

Wylynko, however, argues that there is too much reliance on pesticides and too little consideration of other possible methods of weed and pest control. He suggests such things as organically based herbicides and the use of natural predators.

Although losses might increase, at least at first, says Wylynko, he argues that would be balanced out by the thousands of dollars saved by not purchasing pesticides.

However, Philip points out that while pesticides promise instant results, biological control agents take time to do their work. In today's depressed agricultural economy, the time it takes to build up a population of natural predators, for example, may simply be too long for cash-starved farmers.

But Philip does say more and more farmers are looking for a weed and pest control system that uses both chemical and biological controls "If you raise cattle, for example, the fewer chemicals your animals are exposed to the better." He says that farmers and others who work with pesticides are, naturally enough, sensitive to what effects they might have on their own health.

But Wylynko is not just concerned with farmers' use of pesticides. He wants governments to stop using toxic insecticides to control mosquitoes and black flies until more is known about the long-term effects once these chemicals get into rivers and water sources.

But more than that, he's concerned about increasing householder use of herbicides and insecticides.

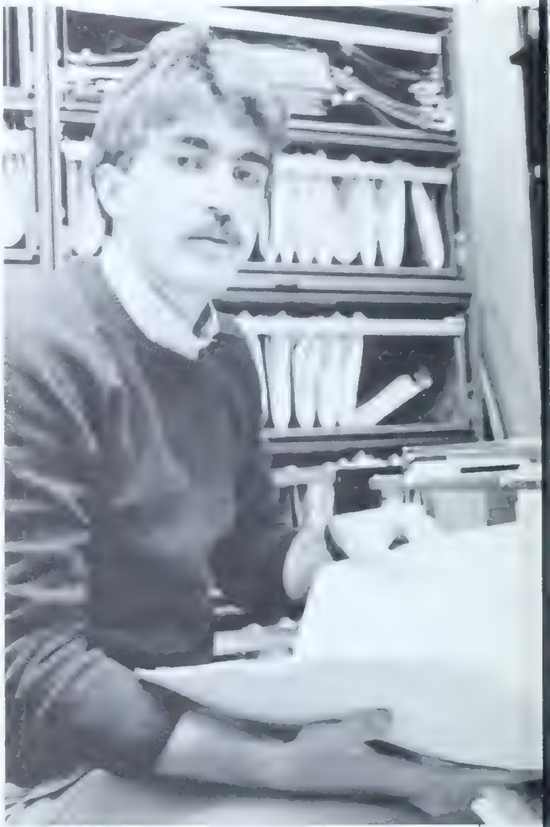
"People spray Killex on their dandelions without thinking it has 2,4-D in it. Then they walk through the grass in their bare feet. Nobody tells them that stuff can enter your body through the skin."

For Wylynko, the answer in the long-term is quality research and in the short term, education and a willingness to "use chemicals if we have to, but only as a last choice."

## *Sour Gas: The Controversy Continues*

Sour gas wells dot the Alberta landscape, and as long as they have been around, there has been a controversy about whether or not the emissions of these plants are a threat to human and animal health.

This controversy eventually resulted in a one-year provincial government study in 1985-86 of the effects of sour gas on communities in the Pincher Creek area of southern Alberta. The $3.7-million study, conducted by Dr. Walter Spitzer, concluded in June, 1986, that it was "unable to detect any excess of life-threatening or disabling conditions" among residents of the area and no increased cancer rates.



*Brad Wylynko*

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Instead of ending the controversy, however, Spitzer's study appeared to keep it going, with area residents immediately questioning its validity.

Their arguments were given fuel earlier this year when Dr. Rosalie Bertell of Toronto, winner of an alternative Nobel Prize in 1986, criticized the study for dismissing residents' health complaints and "relying too heavily on value judgments."

Despite this criticism, however, both Spitzer and others involved with the study believe it has conclusively put to rest fears about adverse effects from gas plant emissions. In an interview at the time, Vern Millard, chairman of the Energy Resources Conservation Board, called Bertell's critique a "disgrace" and reiterated his support for the Spitzer study.

Many of the criticisms of Spitzer's report have centered on its one-year time frame as inadequate for assessing possible long-term effects. However, these questions may finally be answered in the next few years by the results of a University of Calgary study now underway on long-term effects of hydrogen sulphide emissions.

## *Indoor Air Quality*

Ask a scientist about whether the air is cleaner indoors or out and he's likely to tell you, that you and your lungs are better off outside.

It is true that, in general, there is a higher concentration of pollutants indoors. These include things like formaldehyde found in particle board and carpet glues, ozone from office copiers, and carbon monoxide from cigarette smoke, as well as other unpleasantries such as dead skin cells, animal hair and disease germs.

Recent studies are beginning to find solid links between headaches, eye strain, nausea and other minor ailments in office workers and the quality of air in the buildings where they work.

However, once identified, the problem of indoor air quality is usually easily remedied for all but the most sensitive people by properly ventilating an office or home and allowing free air circulation.

The question of indoor air quality, however, has become increasingly important and for the last four years, the Federal Provincial Work Group on Indoor Air Quality has been formulating numerical limits and standards for indoor air pollutants. Dr. Vic Armstrong, head of the environmental criteria section of the federal department of health and welfare, says the group has established standards for nine pollutants including ozone, formaldehyde, carbon dioxide and particulates.

Armstrong says the group's report has now been approved by each province and is expected to be released by the end of the summer to serve as a guide for governments, industry and the public.

*Norma Ramage, the co-author of a book on Kananaskis Country, is a Calgary freelance writer.*

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*Rocco Ciancio*

# What You Can Do

## *Avoid the peanut butter, char the burgers.*

AI BERTA SPECIAL WASTE MANAGEMENT CORPORATION

*In Denmark, neighborhood recycling depots include locked areas for depositing hazardous wastes collected for special processing.*

Almost every waking (and even sleeping) moment involves some health risk to the individual.

On the job or at home, individuals are exposed to a range of hazards, from poor air quality to carcinogens in food.

Further afield, such catastrophes as Bhopal or Chernobyl loom even larger.

In the face of all the various environmental problems, how can the individual assess risks to live a healthy and safe life?

Paul Slovic, a research associate with Decision Research in Seattle, is a professional risk assessor, but he has no easy answers.

"The assessment of risk is so complicated that the ordinary person has to go to some higher level of expertise to understand, for instance, what makes a substance dangerous," he says.

Slovic's studies consistently demonstrate that most people are convinced their lives are in more danger from environmental hazards today than ever before. How did this public perception take hold and is it based in reality?

The public, says Slovic, has a very broad notion of risk. The expert, on the other hand, thinks of risk in the narrow sense of mathematical probability and magnitude. For instance, people underestimate the risk inherent in voluntary yet dangerous activities like driving and skiing, but live in fear of the nuclear plant that is thousands of kilometres away.

"People tend to accept high risk voluntarily but are wary of relatively low risk situations they have little control over," he says.

Slovic and others have criticized the media for fostering a gulf in perception between the public and experts in environmental health areas.

Mark Lowey, environmental reporter for The Calgary Herald, agrees the gulf exists and admits the media is partly to blame. But he says both the public and experts often use subjective criteria to assess risk.

"People look at environmental risks emotionally, especially when they're in their own backyard. In many cases the danger is overestimated," he says. On the other hand, Lowey feels the expert's desire for a cool, rational attitude may be the result of not perceiving the danger on their doorstep.

Despite his confidence in expert advice, Slovic understands the public distrust of low statistical likelihood of a chemical or nuclear power plant disaster.

"In poker, there are very high odds against certain hands coming up, but in every game they do," he says.

The difference in risk perception is fostered by the image an environment under siege portrayed in the popular press. The media focus on catastrophic events increases the feeling of burgeoning risk and, Slovic points out, overwhelms the "daily success stories of environmental work." He also worries the public isn't hearing the truth about how work is being done to limit environmental risks.

"Fair criticism," comments Lowey, "but the nature of journalism is to concentrate reporting on items with overt conflict rather than success stories.

"In a way, it seems unavoidable. People want to read the tragedies and they go on the front page while the success stories might end up on page 23."

In Alberta, the gap between professional and public assessment of risk is evident in the fluoridated water issue.

"The feedback we get," says David Spink, Alberta Environment's head of municipal engineering, "is that many people are still afraid of fluoridation of water."

The province's municipal water systems are split 50-50 between fluoridated and non-fluoridated. In areas where much opposition still exists, such as Calgary and Red Deer, Spink says certain misconceptions may still be at work.

"In the mid-1970s, a study claimed to have found a link between cancer and water fluoridation. Subsequent studies disproved this, but the damage was done."

> *"The safety of the home can be shattered by even the common hamburger."*

Spink also recalls the public outrage when a truck loaded with sodium fluoride, the compound used in water systems, dropped a bag of the chemical on a highway in Fort Smith. A child who consumed some of the chemical died. In fact, early opponents noted that sodium fluoride was the main ingredient of rat poison.

"People would say, 'you're putting rat poison in the water.' In essence we were," says Spink.

But he emphasizes that fluoride is like many other elements; essential to life in small quantities, and lethal in large ones.

Involuntary exposure to harmful compounds is a frightening prospect but the safety of the home can be shattered by even the common hamburger.

Barbecued hamburger doesn't sound like a risky proposition, but this summer, however, three Albertans have died from ingesting E. coli 0157 found in partially cooked burger.

"Ground meat should always be thoroughly cooked," warns Bill Irwin, the regional director of environmental health for the City of Edmonton.

He says the bacteria does not penetrate far beneath the surface of the meat so that even a rare steak is cooked enough to be safe. But in hamburger, the grinding process distributes the bacteria throughout the burger. Irwin also advises caution when handling chicken.

"Ninety per cent of the chicken in our stores is contaminated with salmonella (which can also be fatal). It's no problem if fully cooked, but be careful to wash your hands as well as any cutlery used after preparation."

The dangers of ground beef and poultry aren't expressed on their packages, but even where labels do say what's inside, details about substances are not included. But people can learn about them through

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*Ninety percent of the chicken in our stores is contaminated with salmonella.*

a little-known government service.

Anne Greco, an occupational and environmental health nurse in Calgary, urges people to take advantage of one of two services to learn about substances used both at home and at work.

"You can call the toll-free number of the Canadian Centre for Occupational Health in Hamilton, Ont. They'll find out about any sustance and get a report back to you in about three weeks," she says.

Greco says the Alberta government's Occupational Health and Safety Library in Edmonton will do the same thing for questions about safety of materials.

"They get their information from data sheets compiled by the manufacturer or independent labs. Releasing this information to anyone working with dangerous substances and materials may some day become mandatory."

Greco adds that individuals with health problems apparently related to work usually have difficulty in getting compensation. Pinpointing the exact cause of the problem may take extensive and sophisticated testing over a long period of time. As well, any other possible causes at home or in personal habits must be disproved.

"Right now, there are several cases before the Workers Compensation Board. In one a woman claims she is being made ill by sidestream cigarette smoke. The question is does it cause illness or simply irritation?"

Finding the culprit at home can be even more frustrating, says Greco, because exposure time is reduced. You might paint a room and inhale a lot of fumes one day but you probably won't paint again for three or four years.

"The main thing to remember is even the most dangerous things are relatively harmless if you know how to handle them."

A kitchen should be a clean place, but keeping it and the rest of the house spotless creates its own health risks since many household cleaners contain toxic chemicals.

Greater public awareness of the dangers of toxins has meant a large increase in information requests for Ken Simpson, operations vice-president of Alberta Special Waste Management Corporation.

"We have three bits of advice to householders: purchase carefully, if you can choose a less harmful substance, do it; store it carefully in a cool, dry area because heat will make some containers explode and dampness will corrode others; buy only as much as you need, use it all up and try to give away the rest."

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Dr. Tariq Bhatti

Simpson is happy to report that disposal of dangerous substances will become easier and safer for Albertans by the fall when the Swan Hills state-of-the-art waste treatment project will be accepting municipal garbage.

"There will be special household collections in the major centres," Simpson promises.

Some public opposition has been voiced about the system because of fears about toxic waste storage near urban areas for material destined for Swan Hills.

This question may be one of the issues addressed in Edmonton as part of a concept called "Healthy Cities". Intended to encourage individual and community input on ways to make urban environments healthier, Healthy Cities has been gaining support throughout the world. In July, two Canadian cities sent delegates to a conference organized by the World Health Organization's European region in Dusseldorf, West Germany.

Dr. Tariq Bhatti, health promotion director with the Edmonton Board of Health, headed a team from the capital city. The other Canadians were from Toronto.

"It's in the conceptual stage now but one of the main goals of Healthy Cities is to re-orient health services, to move health policy more into health promotion rather than simply solving problems," says Dr. Bhatti. He emphasizes public health policy should be implemented at the local level with help from existing infrastructure and new consultative alliances. The latter may be an ideal way to begin to bridge the gap in perceptions about environmental risk.

"Health policy must be developed on a multi-sectorial basis — individuals, communities, government, business, all must be a part of the process," he says.

The consultative approach that Dr. Bhatti favors may be gaining support, but there is evidence that individuals and groups may soon be entering the courts to see polluters prosecuted. Legal battles against polluters have been rare in Canada, but Elizabeth Swanson, staff co-ordinator at the Environmental Law Centre in Edmonton, says governments may "have been influenced by policies that might not have been public."

Swanson, however, believes the tables have turned in favor of environmental justice.

"Ontario, with its special enforcement team and tough penalties, is leading the way," she says.

"There is increasing public demand for a clean environment, people have a right to it and government is under pressure to do something."

*Rocco Ciancio is a freelance writer based in Calgary.*

*Norma Ramage*

# Good Citizens

## *Alberta Environment Award Goes to Shell Canada*

This year, for the first time, Alberta Environment presented awards for environmental good citizenship in three categories: public, industry and agencies.

Shell Canada Limited won the industry award for its overall environmental performance as well as for its specific work in reclamation at the company's Moose Mountain plant in Kananaskis Country.

Doug Mead, staff ecologist with Shell's safety and environmental affairs department, was happy about the award but particularly gratified that it was given, in part, for work at Moose Mountain, a project that was the focus of controversy when it was proposed in the early 1980s.

Both environmentalists and government were concerned that the location of the gas compressor station and pipeline was too close to the heavily-used Canyon Creek recreational area of Kananaskis Country. The province had plans to develop the area close to the popular Canyon Creek Ice Caves and had concerns about the compatibility of recreational and industrial uses.

Shell's initial application to the Energy Resources Conservation Board was consequently turned down but the company immediately instituted a $250,000 study in conjunction with Alberta Environment to find new and innovative ways to reduce any environmental clash.

The resulting special measures included reducing the standard 30-metre access routes to half that width, "snaking" the pipeline to avoid unsightly, ruler-straight cutlines and to go around high-use recreational areas, and designing buildings and facilities to blend in with surroundings. When pipeline construction required temporary closing of an all-terrain vehicle trail, the company compensated by building new, replacement trails.

The result was approval of the $45 million project in 1983 and, four years later, the company's selection as the first winner of the Alberta Environment Award.

The award is particularly special to the company, says Mead, because nominations came not from industry or government but from the public at large.

Equally important, says Mead, is that the award recognizes not just the work at Moose Mountain but also Shell's over-all environmental good citizenship. But Mead says Shell's concern about the environment is nothing new, pointing out that in 1985 the company won Alberta Fish and Wildlife's Big Horn Award for a habitat project at its Waterton sour gas plant. Even the Alberta Wilderness Association, frequently a severe critic of industry's environmental performance, singled out Shell for praise two years ago for its reclamation work on an access road in the Panther Corners area about 100 km. northwest of Calgary.

The key to Shell's success, says Mead, is the attitude of the company's top management. "When I was hired six years ago, I was interviewed by people at the vice-president and manager level and I was impressed with the sincerity of these people, with their wanting to do what was right environmentally."

Without this kind of attitude at the top, says Mead,

no environment department can be successful in the field. Few employees in the field will do more than give lip service to good environmental planning and management if they know their bosses give it low priority, explains Mead.

At Shell, says Mead, one effect of the commitment by top management is the hiring of people like Larry Thielen, construction foreman at the Moose Mountain project and the man Mead feels is responsible for much of the success of the reclamation work.

"People like Larry have very little formal environmental training, they just do what they know is right. He thought of that project as his project and he was very proud of what was done. It's people like Larry whose job description may not say anything about environmental responsibility that have such an impact in the field and make things work."

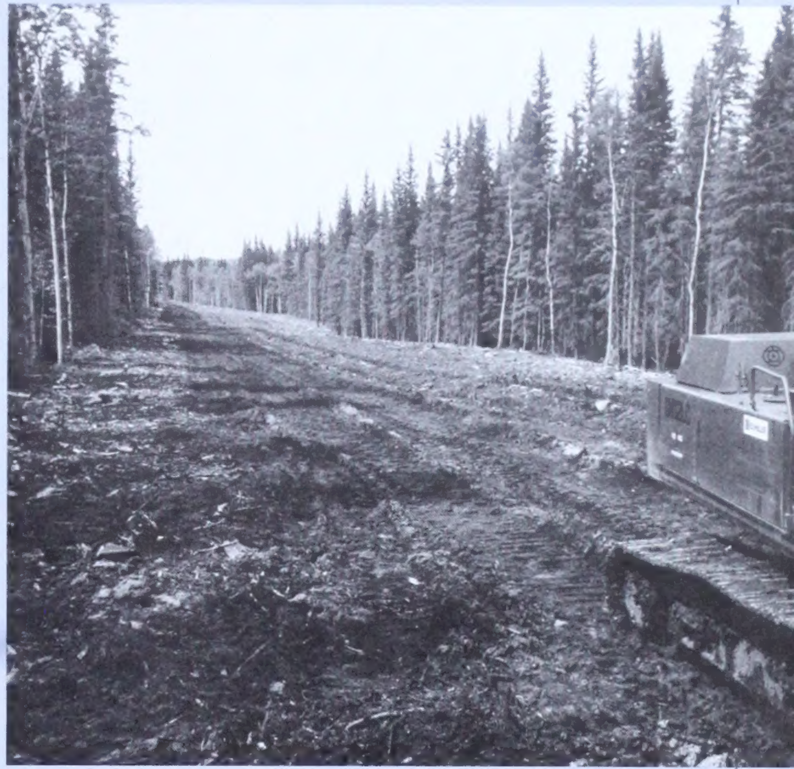
Although Shell has approximately 25 people who are directly identified as working with environmental matters, Mead says there are people like Thielen throughout the company. "Some companies need environmental inspectors to go around and check that things have been done. We don't need to do that with the kind of people we have. We know it's going to be done right."

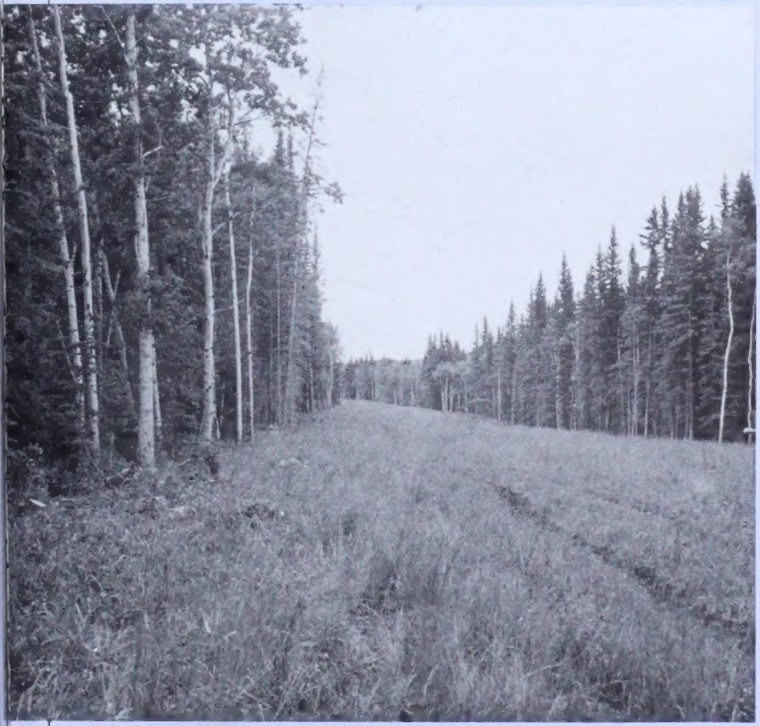
Mead admits that not all oil companies have Shell's commitment, but he thinks they should have. It is, he says, not only a matter of protecting the environment, it is also good public relations.

"I feel that many things are perceived problems rather than real environmental problems, but it is still important to address them and deal with them. Too many companies don't realize this."

There are also companies, he adds, that feel governments and the public should not be telling them how to run their business. But Mead says that Shell has found that involving the public and informing them in advance of the company's plans has been very successful in avoiding controversy and confrontation.

*Before and after photos illustrate the reclamation Shell has accomplished at its Moose Mountain project.*





He cites as an example the success the company had in building a sour gas plant near Dawson Creek, Alberta several years ago. Although other companies had run into stiff competition with earlier, similar proposals, explains Mead, Shell received ERCB approval without a hearing because of its "up front" approach to the public.

"After all, we're going to be in a location 25 or 30 years. We want to live with these people harmoniously, not have them angry at us from the beginning."

Mead also believes it is up to major oil companies like Shell to set an environmental example for smaller members of the oil patch. "Let's face it, good environmental management costs money and this is an industry that focuses on short-term economic returns. The majors can take the long-term view because we can afford it."

But Mead believes the example and experiences of Shell and other large oil companies can show smaller companies there are both economic and public relations advantages to a good environmental management program. He points to a project by the Canadian Petroleum Association which represents many of the larger oil companies to develop an industry environmental policy by next year.

"Then I think you'll see peer pressure on other companies to improve their environmental performance," says Mead.

*Norma Ramage, the co-author of a book on Kananaskis Country, is a Calgary freelance writer.*

## BOOK REVIEW *by David Spalding*

# The First Albertans

*Blackfoot camp with horse travois — photo circa 1883.*

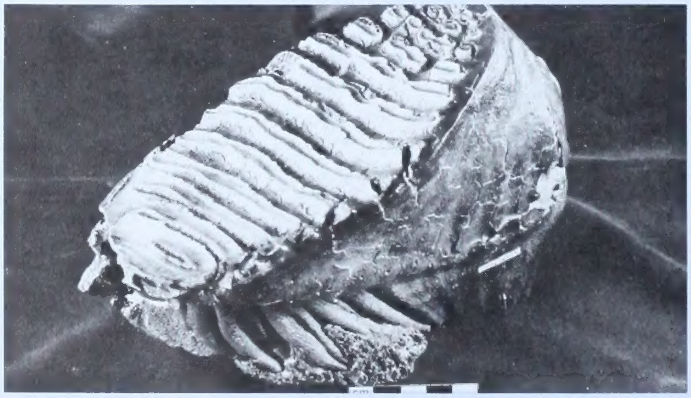
LONE PINE PUBLISHERS

Albertans are fortunate in having a significant number of popular books available on different aspects of their environment. The Archaeological Survey of Alberta has now collaborated with an Alberta writer and publisher to fill a major gap — the story of the human prehistory of the province. The text is a collaboration which originated in the Survey and was finished by author Gail Helgason (who describes herself as "the second writer" without naming a first). It is intended for a general readership.

The coverage is much wider than the title suggests, as the book presents not only the story of prehistory in the province from the earliest people to the beginning of historic times, but also has a chapter on historic archaeology. Some aspects of archaeology today are briefly discussed, and an appendix presents information about some archaeological agencies and museums. There is a glossary, but (alas) no index. The illustrations are attractive and useful, and include historic photographs of Indian life, many photographs of sites, diagrams and drawings, and some color restorations of the life of early peoples.

The text presents a fascinating picture of prehistoric Alberta, starting with the origin of the native peoples in Asia, and the search for the **ice free corridor** along which people may have reached North America south of the glaciers. Later chapters discuss the evolving strategies for hunting on the plains, culminating in the great buffalo jumps. The scene then moves to northern Alberta, where the Indians have responded to the different environment by developing different lifestyles, and the relatively recent search for archaeological sites is beginning to bear fruit. The historic chapter discusses fur trade and police forts, missions and residences, and shows how archaeological methods have been used to illuminate the history of sites which were in use as recently as the 1930s.

In this broad survey some topics inevitably have to be dealt with briefly, but it is a pity these include such fascinating stories as the medicine wheels, boulder figures and pictographs that first interest many people in archaeology. There is surprisingly little coverage of the process of archaeology as carried out in the province, which would have helped clarify the rest of the text. A fuller history of Alberta archaeology than one page allows could have offset a general vagueness that leads to an apparent undervaluation of the contributions to the growth of archaeology in the province of Alberta's universities, the Glenbow Foundation, the Provincial Museum of Alberta, and the amateur.



*Mammoth tooth found near Edmonton.*

LONE PINE PUBLISHERS

The story is interesting, and it is unfortunate that the style does not always make it easy for the general reader to follow. Many technical terms are used, and a good background knowledge is helpful. The many people who confuse archaeology with palaeontology and are not sure whether prehistoric men hunted dinosaurs are likely to be somewhat baffled by a text stuffed with words like *atlatl, sinodonty* and *reductive technology*. Some terms are not explained until long after they are first used, and a selective and vague glossary is not as helpful as it might be.

More serious is a sprinkling of errors when the text ventures outside local archaeology. For example, a reader unfamiliar with the field is likely to be somewhat confused when told that caribou, wolves and sheep "mysteriously disappeared" ten thousand years ago, or that "glacial till ... eroded down the ... land surface". The specialist may be surprised to learn that Schliemann began Mediterranean archaeology, and that the plural of "shaman" is apparently "shamen".

A more subtle, but perhaps more serious problem, is the limited Indian perspective given to the story. Prairie archaeology originated as a non-Indian perspective on Indian culture, and although that position is slowly changing as Indians begin to use archaeological methods, it still tends to be written as if the views of Indians on their (pre)history have no significance. Unfortunately, the reader will not learn here that many Indians do not accept the Bering Strait theory of their origins or that to many the Indian religion is still alive and some of the myths, objects and rituals discussed (and even photographed) here are to their makers sacred and secret.

With its publication, **The First Albertans** becomes the best available popular book on the prehistory of the province. The errors and inconsistencies may perhaps have been remedied with more time — the author indicates that only three months were available to prepare a first draft of the book. It is hoped that a future edition will make this book what it set out to be — essential reading for all Albertans with an interest in the past of their province.

**The First Albertans. An Archaeological Search.**
Gail Helgason. Lone Pine Publishing, 1987. 222p. $12.95

*David Spalding, the former head of Natural History at the Provincial Museum of Alberta.*

## LETTERS TO THE EDITOR

**DEAR EDITOR:**

After three days of hard winds, we have watched the topsoil blowing to who-knows-where. I read in your June issue about Neall Coulson, an organic grower in Alberta. I too, am an "agricultural heretic" as are an increasing number of farmers, horticulturists, and producers. Perhaps you can let interested folk know about our organization, The Sustainable Agriculture Association (S.A.A.). As well as assisting farmers with the transition from agro-chemical to more ecological conservation production methods, we are certifying organic food producers so you the consumer have some idea of what it takes to produce an "organic" product. Our local producers, who struggle in the adverse weather conditions, should be supported. Our organic growers, who often sacrifice short term monetary profit for long-term sustainability and soil health deserve a double round of applause. Please write if you require more information as a grower or a consumer.

The S.A.A.
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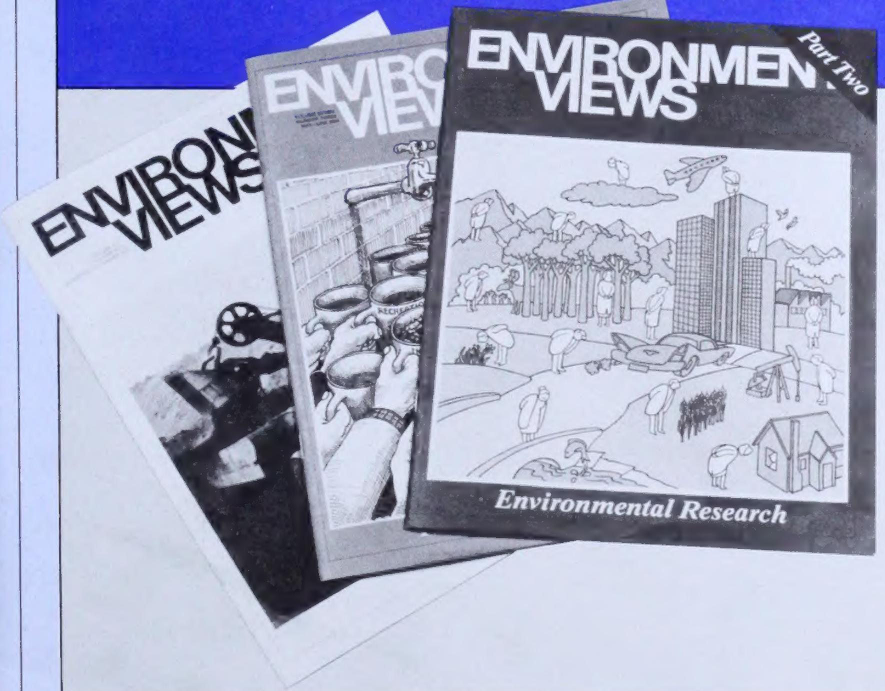
or
Box 712,
Sub Station 11
Edmonton T6E 1P3
Phone: 646-5752

Thanks
Sharon Rempel
President, The S.A.A.



## You Can Help

You can help us meet our target of doubling our mailing list by the end of the year. If you belong to an organization whose members would be interested in Environment Views, contact us, and we will send sample copies for your next meeting or conference.

We're trying to develop a list of locations for free distribution of the magazine to people who would be interested in environmental issues (libraries, municipal buildings, reading rooms, etc.). If you have a suggestion, contact Maria at Alberta Environment Communications, 12th Floor, Oxbridge Place, 9820 - 106 St., Edmonton T5K 2T6 (427-6267).

As always, subscriptions are free. Send in the subscription card if you're not a subscriber and you would like to receive Environment Views, or pass it along to a friend who would be interested.

If undelivered, return to:

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## ENVIRONMENT UPDATE

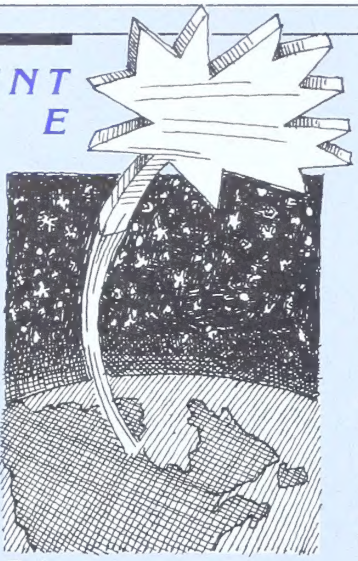
### Canada in Space

Beginning Sept. 29, the Edmonton Space Sciences Centre presents *Space: The Incredible Odyssey*, a planetarium program depicting the story of space flight, the space age and a celebration of Canada's 25th anniversary in space.

In connection with the 25th anniversary celebrations, the centre is presenting a lecture series on *Canada in Space* Sept. 29 - Oct. 1. Speakers will include Canadian astronaut Bob Thirsk and Christopher Trump of SPAR Aerospace Ltd., manufacturer of the Canadarm. For further information and show times call 451-7722. The Edmonton Space Sciences Centre is at 11211 - 142 St. in Edmonton.

### PACs To Meet

Communications is the topic when the public advisory committees to the Environment Council of Alberta hold their annual joint meeting in Edmonton Dec. 3 and 4. The sessions are open to the public. Speakers will include media people, politicians and representatives of environmental interest groups and government.



### Private Conservation

The Environmental Law Centre will present a one-day seminar on the topic of private conservation Saturday Sept. 26 in the lecture room of the Provincial Museum, 12845 - 102 Ave. Edmonton.

The goal of the conference is to encourage private conservation of pieces of land which individuals feel are worth saving. Legal experts will make presentations on practical legal problems involved in private conservation, including legal alternatives, tax implications, the role of the Natural Areas program, trespass, surface rights, occupiers' liability. There will be panel discussions by associations involved in private conservation.

A $10 fee includes the Environmental Law Centre's Conservation Kit. Deadline for registration is Sept. 18. call the Environmental Law Centre at 482-4891 for information.

### Review Panel Appointed

In August, Environment Minister Ken Kowalski announced the appointment of a panel to review environmental law enforcement in Alberta.

The purpose of the review is the strengthening of Alberta's environmental laws, the minister said. The panel will examine Alberta's current approach to enforcement and prepare an action plan for making improvements.

Panel members were selected based on their knowledge of environmental law and Alberta's enforcement practices. They are: Ken Smith, assistant deputy minister, Environmental Protection Services, Alberta Environment (chairman); Jillian Flett, environmental consultant (secretary); Neil McCrank, assistant deputy minister, Criminal Division, Attorney General's Department; Denny Thomas, lawyer; Donna Tingley, executive director, Environmental Law Centre; Al Hyndman, general manager, Development Department, Syncrude; and Dr. Ron Wallace, president, Dominion Ecological Consultants, Ltd.

Among the tasks facing the panel is a detailed examination of Alberta's approach to enforcing environmental laws, a review of enforcement in other jurisdictions.

The panel's recommendations will take the form of an "action plan" to be submitted to the minister during the fall. Among the changes which will follow the review, Mr. Kowalski says, will be the creation of a new Environmental Enforcement Division.

**If you have a short news item of province-wide interest you'd like to contribute to Environment Update, please send it to the editor at the address on the Contents page. The editor reserves the right to select and edit the items.**